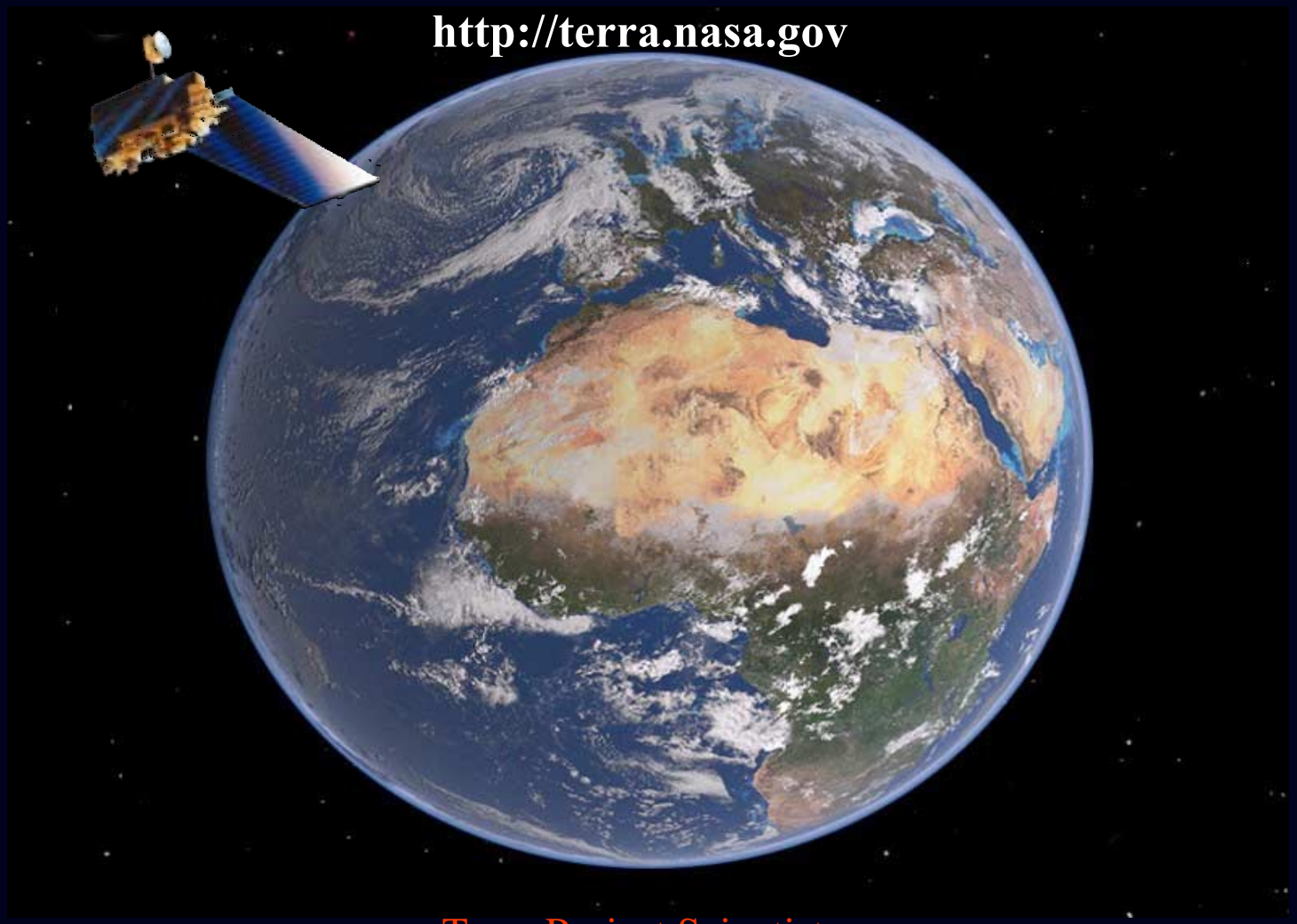
NASA's Earth Observing System
Terra Mission

http://terra.nasa.gov



Terra Project Scientist
NASA's GSFC, Biospheric Sciences Branch

March 18, 2004

Terra

Launch Date:December, 18 1999
First Light: February 24, 2000
Orbit: 705 km (w/Landsat 7, EO-1, SACC)
Polar, 98.88 min. period
Inclination: 98.3 degrees
Equator Crossing :10:30 am Descending
Ground Track Repeat:16 days(233 orbits)
Design Life: 6 years

Instruments:

ASTER- Advanced Spaceborne Thermal Emission Radiometer- Japan
CERES - Clouds and Earth's Radiant Energy System- LaRC
MISR - Multiangle Imaging SpectroRadiometer- JPL
MODIS - MODerate Resolution Imaging Spectrometer - GSFC
MOPITT - Measurement Of Pollution In The Troposphere- Canada

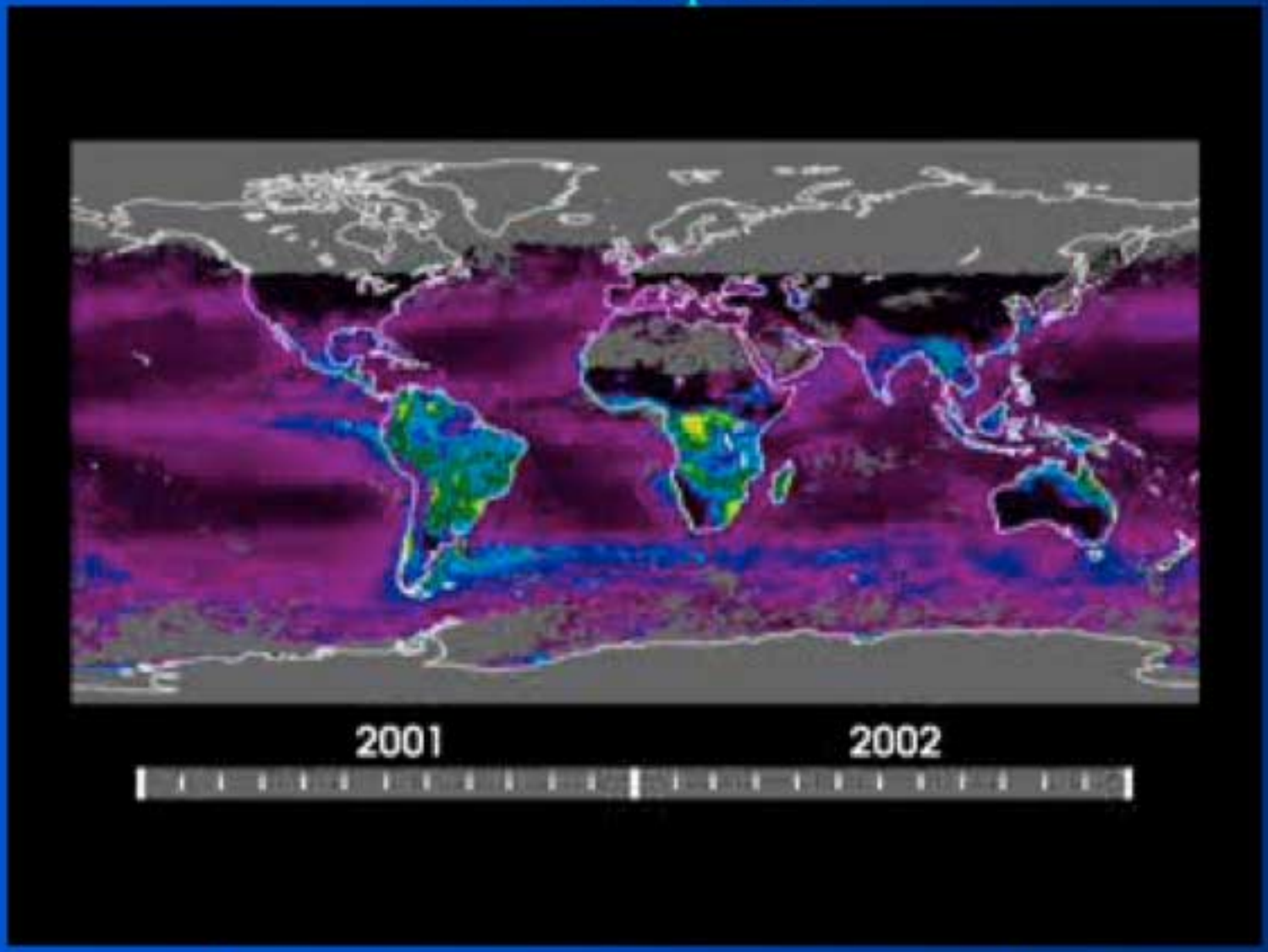
Terra Status

- 22000 + orbits
- All instruments acquiring science data
- Unprecedented volumes of validated science data now in Distributed Active Archive Centers (DAACs)
- Aerosol optical properties, sea surface temperature, water vapor concentration, and numerous other land, atmosphere, and ocean properties validated using aircraft and ground-based observations.
- Deep space and lunar calibration maneuvers finally performed for CERES, MODIS, MISR and ASTER.
- Joined by new EOS Missions: Aqua, ICESat in past 1+ years.
- A few anomalies this past year – Solid State Recorder, Science Formatter Equipment, Safehold, MODIS solar diffuser door. – FOT and IOTs all rose to the occasion in a professional and efficient manner.

Terra's Earth Science Accomplishments

- Land cover classification, atmospherically corrected vegetation index, spectral reflectance enhance ability to monitor health of global vegetation
- Sea surface temperature and ocean biological productivity at 36 km resolution globally—invaluable for assessments of carbon uptake by the oceans
- Global fire monitoring and rapid dissemination to US and international forest services
- First global analyses of CO from space other than brief Shuttle missions
- First global aerosol loading over land and ocean that separates anthropogenic (industrial pollution & biomass burning) from natural pollution (desert dust and sea salt)
- Global snow distribution at unprecedented accuracy
- Demonstrated enhanced forecast skill when assimilating polar winds into medium range weather forecast models

The Biosphere



Land and Ocean net primary productivity from MODIS

W. Esaias GSFC
S.Running U. MT

California
Sequoia Nat'l Forest Fires

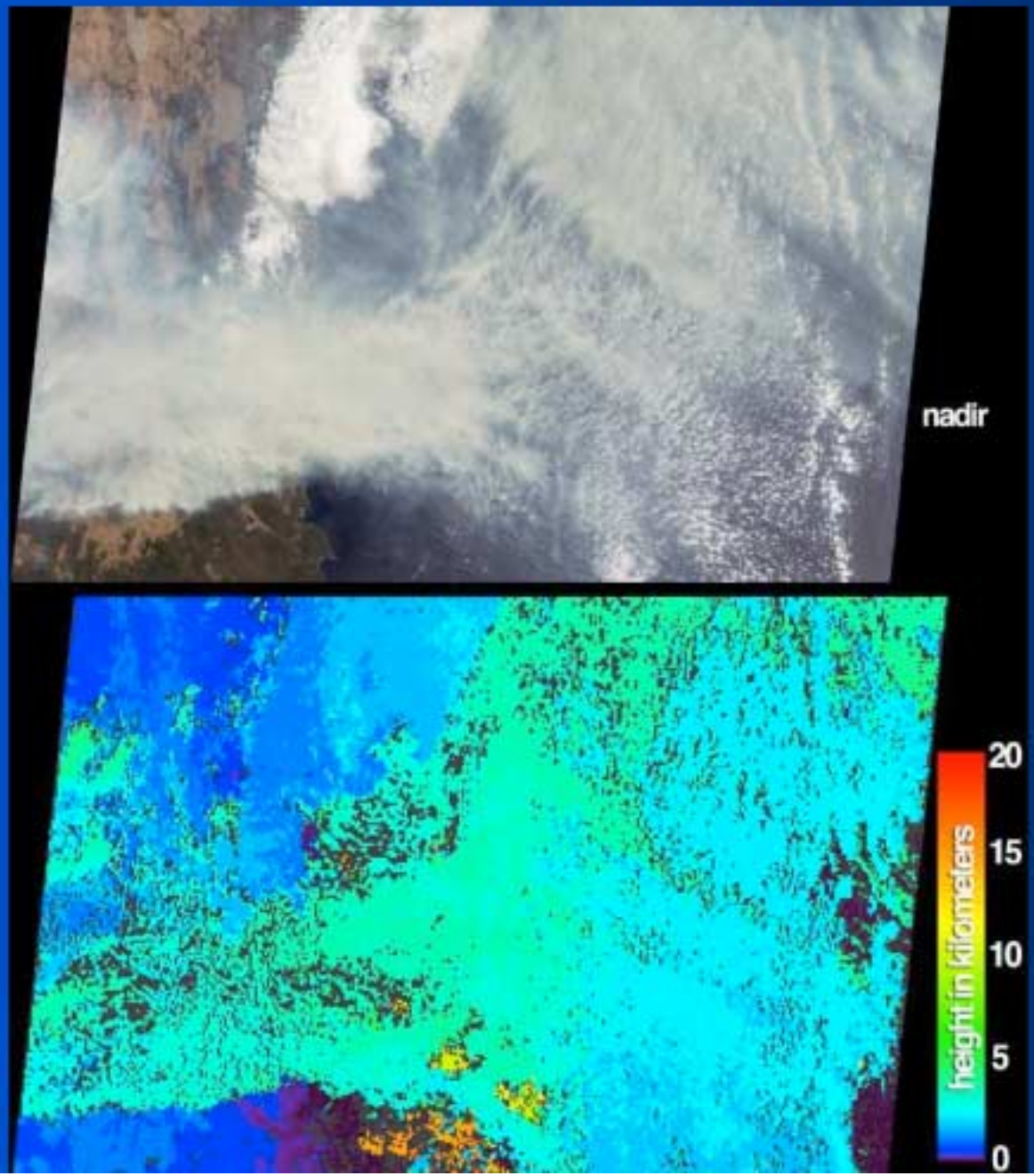
August 11, 2003

MODIS Rapid Fire Response is used by the US Forest Service Remote Sensing Applications Center to make Daily Regional Fire Maps

ASTER 15m VNIR and 30 m SWIR used to analyze burn scars.

Southeastern Australia

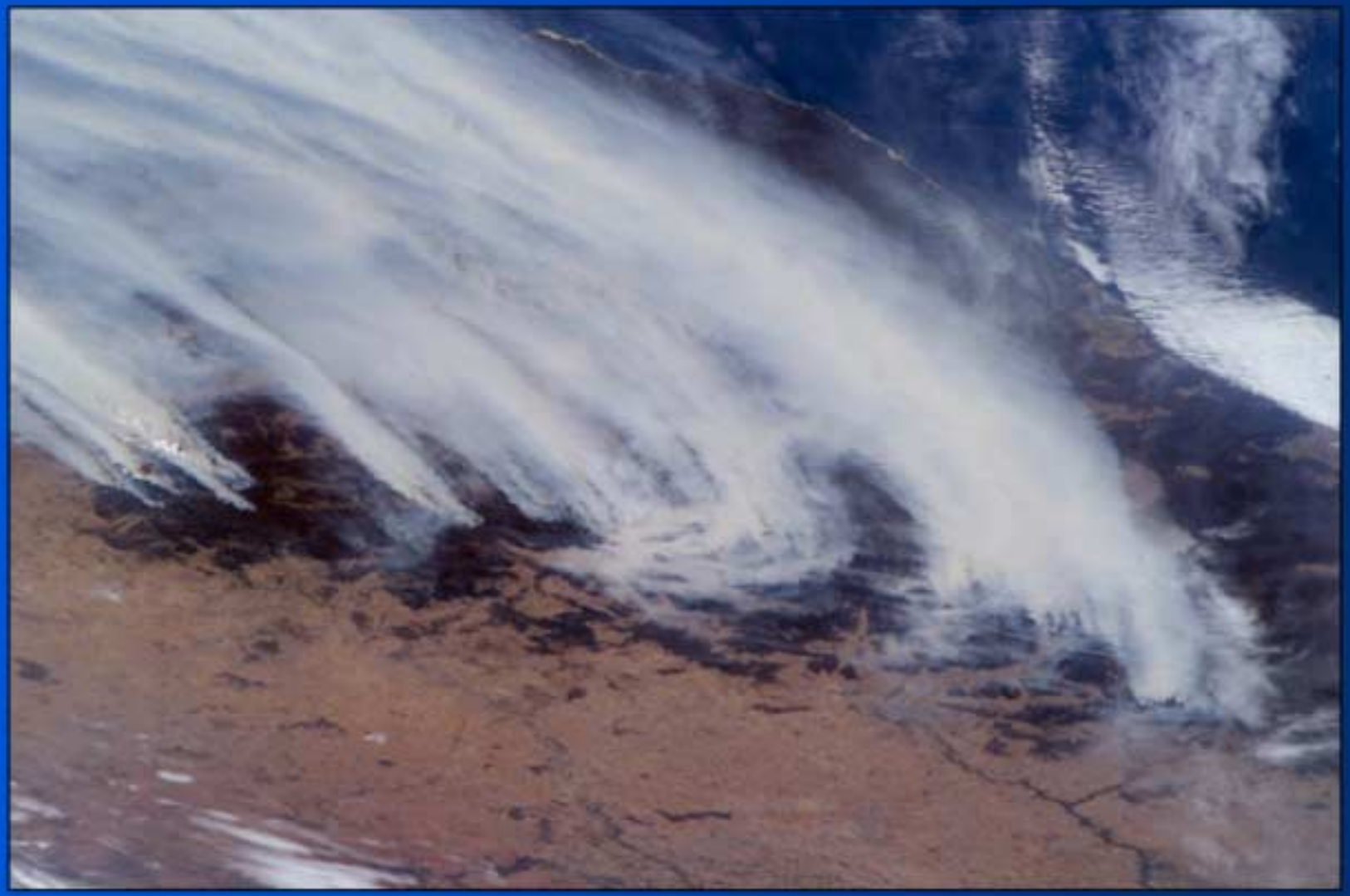
January 18, 2003



MISR

Southeastern Australia

Space Station crew photo



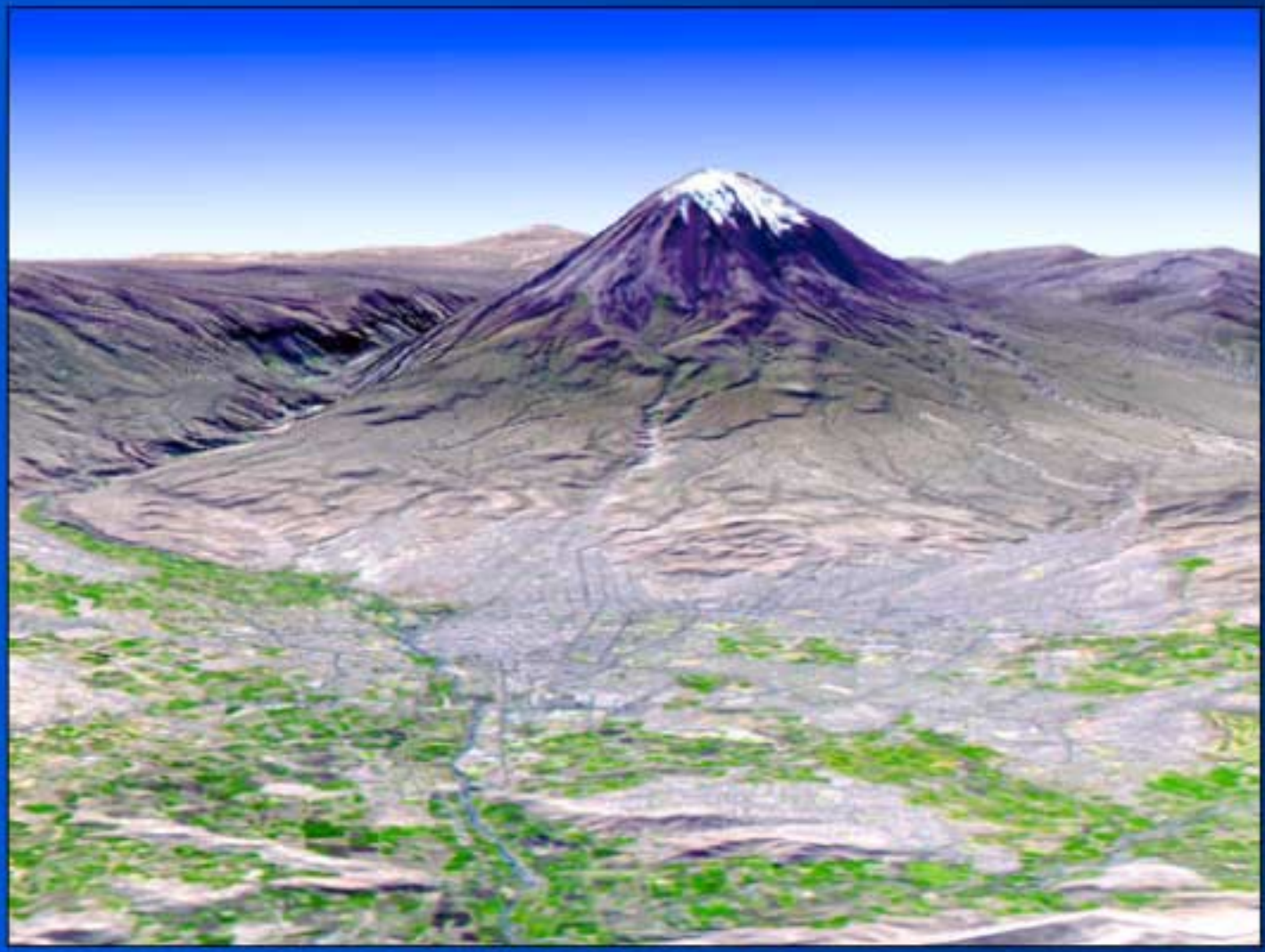
Jan. 18, 2003


SOLAR PDE

Fires in Quebec Smoke in MD

July 8,2002

ASTER



El Misti volcano and the city of Arequipa, Peru July 13, 2001

Highlights

Terra MODIS and EO-1 rapid response activity

- Joint calibration workshop in Maryland last month – EO1, Landsat and Terra instruments represented.
- Deep space and lunar calibration perfored flawlessly. Near Simultaneous lunar view by EO-1 and Terra instruments (ASTER, MISR, MODIS) during Lunar DSC, cross comparisons on-going. Third maneuver being discussed.
- Science Working Group On Data workshop on data access and usabilty held in November – draft report is circulating.

Constellation Meeting in Buenos Aries - November

ISSUES

- New sciences team being organized – some turnover and additional members
- ASTER Japan asking about using the direct downlink capability- potential impacts on data acquisition and MODIS direct broadcast.
- Concerns about long term archive

Web Sites

Mission

http://terra.nasa.gov

Education

http://earthobservatory.nasa.gov/

Images

http://visibleearth.nasa.gov/

http://earthobservatory.nasa.gov/

Won the 2003 Webby Award for Education

and

2002 and 2003 People's Voice Award for Science